

# EXERCISES

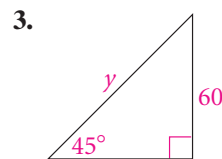
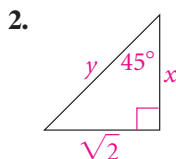
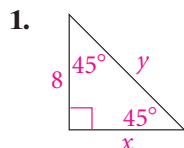
For more practice, see *Extra Practice*.

## Practice and Problem Solving

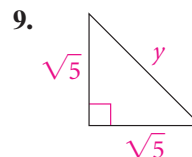
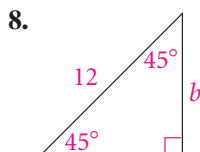
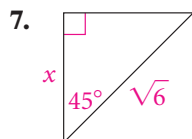
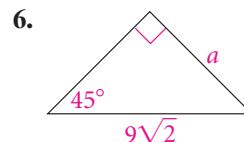
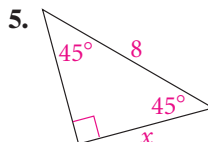
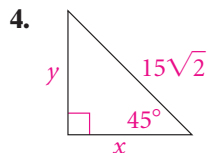
### A Practice by Example

**Example 1**  
(page 366)

Find the value of each variable. If your answer is not an integer, leave it in simplest radical form.

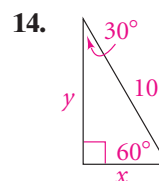
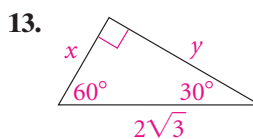
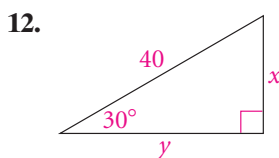


**Examples 2, 3**  
(page 367)

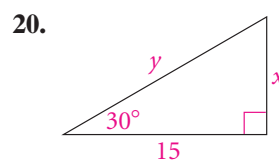
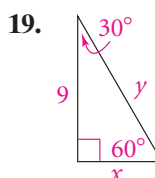
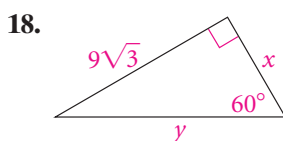
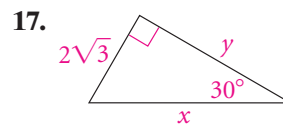
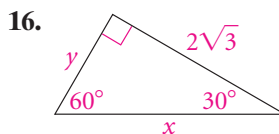
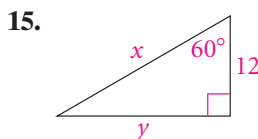


10. **Dinnerware Design** You are designing dinnerware. What is the length of a side of the smallest square plate on which a 20-cm chopstick can fit along a diagonal without any overhang? Round your answer to the nearest tenth of a centimeter.
11. **Helicopters** The four blades of a helicopter meet at right angles and are all the same length. The distance between the tips of two adjacent blades is 36 ft. How long is each blade? Round your answer to the nearest tenth.

**Example 4**  $x^2$  **Algebra** Find the value of each variable. If your answer is not an integer, leave it in simplest radical form.



**Example 5**  $x^2$  **Algebra** Find the value of each variable. Leave your answer in simplest radical form.



**Example 6**  
(page 368)

**Find the area of each figure. Round your answer to the nearest tenth.**

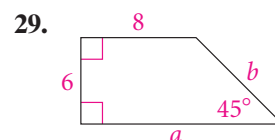
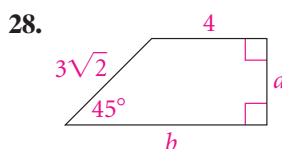
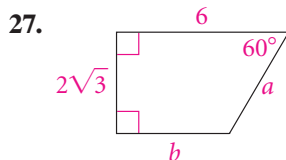
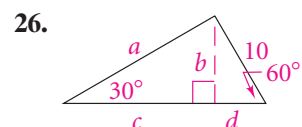
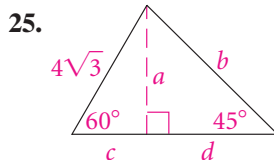
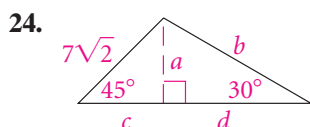
21. an equilateral triangle with sides 10 cm
22. a rhombus with a  $60^\circ$  angle and sides 5 cm long
23. a rhombus with a  $45^\circ$  angle and sides 12 m long



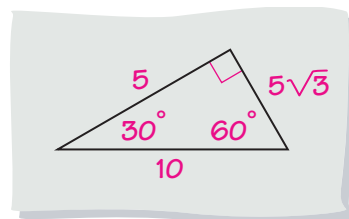
**Apply Your Skills**



**Algebra** Find the value of each variable. Leave your answer in simplest radical form.



30. **Error Analysis** Sandra drew the triangle at the right. Rika said that the lengths couldn't be correct. With which student do you agree? Explain your answer.



31. **Open-Ended** Write a real-life problem that you can solve using a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle with a 12 ft hypotenuse. Show your solution.



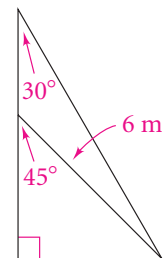
32. **Farming** A conveyor belt carries bales of hay from the ground to the barn loft 24 ft above the ground. The belt makes a  $60^\circ$  angle with the ground.

- a. How far does a bale of hay travel from one end of the conveyor belt to the other? Round your answer to the nearest foot.
- b. The conveyor belt moves at 100 ft/min. How long does it take for a bale of hay to go from the ground to the barn loft?

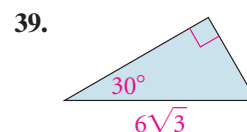
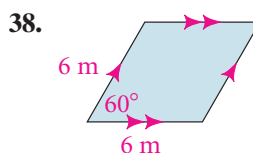
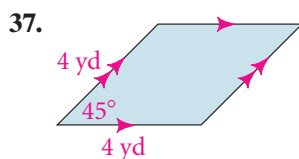
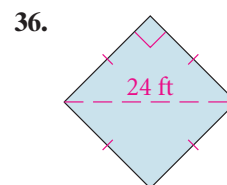
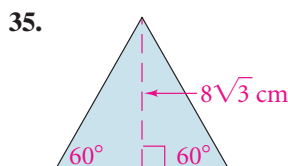
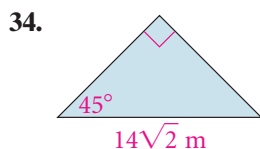


33. **House Repair** After heavy winds damaged a farmhouse, workers placed a 6-m brace against its side at a  $45^\circ$  angle. Then, at the same spot on the ground, they placed a second, longer brace to make a  $30^\circ$  angle with the side of the house.

- a. How long is the longer brace? Round your answer to the nearest tenth of a meter.
- b. How much higher on the house does the longer brace reach than the shorter brace?

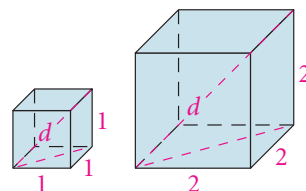


**Find the area of each figure. When an answer is not a whole number, round to the nearest tenth.**



## Challenge

40. **Geometry in 3 Dimensions** Find the length  $d$ , in simplest radical form, of the diagonal of a cube with sides of the given length.
- a. 1 unit      b. 2 units      c.  $s$  units



41. a. Find the area of an equilateral triangle with altitude 1 unit. Leave your answer in simplest radical form.
- b. Use the relationships among the lengths of the sides in a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle to find a formula for the area of an equilateral triangle in terms of the length  $h$  of an altitude.
- c. Use your formula from part (b) to find the area of an equilateral triangle with altitude of length 6 units.



## Standardized Test Prep

### Quantitative Comparison

Compare the boxed quantity in Column A with the boxed quantity in Column B. Choose the best answer.

- A. The quantity in Column A is greater.  
 B. The quantity in Column B is greater.  
 C. The two quantities are equal.  
 D. The relationship cannot be determined from the information given.

#### Column A

#### Column B

42.	the length of the diagonal of a square with sides of length 3	the length of a leg of a $45^\circ$ - $45^\circ$ - $90^\circ$ triangle with hypotenuse of length 3
43.	the length of the shorter leg of a $30^\circ$ - $60^\circ$ - $90^\circ$ triangle with hypotenuse of length 4	the length of the hypotenuse of a $30^\circ$ - $60^\circ$ - $90^\circ$ triangle with longer leg of length $\sqrt{3}$
44.	the length of an altitude of an equilateral triangle	the length of the shorter leg of a $30^\circ$ - $60^\circ$ - $90^\circ$ triangle



### Take It to the NET

Online lesson quiz at  
[www.PHSchool.com](http://www.PHSchool.com)  
 Web Code: afa-0703

### Multiple Choice

### Short Response

45. What is the length of a diagonal of a square with sides of length 4?  
 A. 2      B.  $\sqrt{2}$       C.  $2\sqrt{2}$       D.  $4\sqrt{2}$
46. An isosceles right triangle has area  $16 \text{ m}^2$ .
- a. Find the length of each leg. Leave your answer in simplest radical form. Justify your answer.
- b. Find the length of the hypotenuse. Justify your answer.

## Mixed Review

### Lesson 7-2

An isosceles triangle has 20-cm legs and a 16-cm base. Find each of the following. Leave your answers in simplest radical form.

- 47. the length of the altitude to the base
- 48. the area of the triangle

### Lesson 6-4

Determine whether each quadrilateral must be a parallelogram. If not, provide a counterexample.

- 49. The diagonals are congruent and perpendicular to each other.
- 50. Two opposite angles are right angles and two opposite sides are 5 cm long.
- 51. One pair of sides is congruent and the other pair of sides is parallel.

### Lesson 4-3

Can you conclude that  $\triangle TRY \cong \triangle ANG$  from the given conditions? If so, name the postulate or theorem that justifies your conclusion.

- 52.  $\angle A \cong \angle T$ ,  $\angle Y \cong \angle G$ ,  $\overline{TR} \cong \overline{AN}$
- 53.  $\angle T \cong \angle A$ ,  $\angle R \cong \angle N$ ,  $\angle Y \cong \angle G$
- 54.  $\angle R \cong \angle N$ ,  $\overline{TR} \cong \overline{AN}$ ,  $\overline{TY} \cong \overline{AG}$
- 55.  $\angle G \cong \angle Y$ ,  $\angle N \cong \angle R$ ,  $\overline{RY} \cong \overline{NG}$